BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE
AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

Five Papers on Major Managerial Problems in the Automobile Industry

Improving Department Store Technique

Why Systems Fail

Engineering Societies Building
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New York

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Comment

IN THIS issue are printed the automobile papers of the Ann Arbor meeting. They reflect the problems of a great industry as it emerges from the pioneering stage of development loaded with productive capacity which has for the time being overreached itself. The industry is exceptional in its achievements in engineering, in volume production and in low cost of direct labor production; but it has harder problems than these to solve in the intensely competitive market ahead. It has learned well the seamanship of sailing with the current in calm weather; now it must learn the seamanship necessary to make port in foul weather.

NO OTHER industry has enjoyed a greater fortune. To the pioneers of thirty years ago, investment in the industry may have seemed to be a gamble, but events have proved that generally it was a dead sure gamble. It is the story of a commodity with superlative elements of appeal to consumer demand appearing upon the market at that moment of industrial development when consumers were cashing in on the results of decades of investment in the exploitation of America's resources. The consumers were there in abundance; they had the ready cash not only to purchase the vehicles but also to reconstruct the highways for their use; the new commodity combined elements of appeal to pleasure, social status and utility. The result was inevitable.

UNDER such conditions the industry could grow to great proportions, make enormous profits and establish itself firmly. With a sellers' market and volume production it could develop those mechanical refinements of management which result more or less automatically under such conditions, just as agriculture developed the gang plow, seeder, cultivator, mowing machine and binder under comparable conditions. But apparently now the industry is confronted by a market which is not exhausted but less fertile. That means new methods of cultivation—soil analysis; fertilizers in various proportions; more careful ploughing, harrowing and seeding; more precise adjustment of crops one to another; selection of seeds; in short, science in management.

WE FIND in Mr. Collins' paper that the industry entered the year 1925 with a capacity of 5,650,000 motor vehicles; that the output during 1924 had been some 3,618,000 vehicles, and that indications the early part of the present year were that demand would not be greatly in excess of that of 1924; that for the first time the number of new buyers entering the field is beginning to show a drop; that dealers are now selling more used cars than new cars; that price reduction and real competition have set in. From Mr. Jewett's paper we learn also that "a buyers' market and intense competition are in evidence. . . At the New York show in 1923 there were 113 exhibitors; in 1924, 71; in 1925, 52; and I predict in 1926 between 40 and 45. . . Larger production in fewer plants is indicated."

ALL of this means that the automobile industry is about to learn something about refinements of good management. Mr. Collins concludes that the industry is gradually passing from the era of development to the era of stabilized merchandising. Mr. Jewett emphasizes the distribution problem and cites efforts to make dealers better business men by teaching them cost accounting and by giving them quotas based on market analysis. Mr. Litle questions the advantage of frequent change of model. It is well that the distribution problem is thus recognized as the present big problem. But the assumption that the production problem has been solved is not well. It is true that direct labor costs are low, but the cost in overhead of faulty general and department organization for production still includes a big waste.

Taylor and Trade Unions[1]

By Frank B. Copley 658:331.15

I HAD thought that the attitude of Frederick W. Taylor toward labor unions was easy to read in the biography of Mr. Taylor I had the honor of preparing. It would appear, however, that some of the reviewers have not fully understood Mr. Taylor in this connection; perhaps you will grant me space for a statement designed to settle this matter finally.

As an example of the lack of understanding to which I refer, I may take Mr. John A. Fitch's review which, prepared for the *Machinists' Monthly Journal,* was reprinted in the Taylor Society BULLETIN for June, 1925. In view of Mr. Fitch's evident appreciation of many phases of Mr. Taylor's personality and work, and in view also of Mr. Fitch's generous references to the part played by me as Mr. Taylor's biographer, it may seem ungracious of me to find fault with some of his statements. As a matter of fact, Mr. Fitch's review, in the main, appealed to me very much, and I would not venture to question any of his statements did I not feel that my object of clearing up Mr. Taylor's attitude toward labor unions has no little importance.

Mr. Fitch says that Taylor had "no formula for the defense of the workers against the 'fool' employer." Surely Taylor not only did have such a formula, but it was exactly the same as Mr. Fitch's; namely, labor unionism. This, I think, must clearly appear when due weight is given to Taylor's utterances in this connection. For example, in "A Piece-Rate System," presented at a meeting of the American Society of Mechanical Engineers in 1895, he said:

> The labor unions—particularly the trades unions of England—have rendered a great service not only to their members, but to the world, in shortening the hours of labor and in modifying the hardships and improving the conditions of wage-workers. . . .
>
> When employers herd their men together in classes, pay all of each class the same wages, and offer none of them any inducements to work harder or do better work than the average, the only remedy for the men lies in combination; and frequently the only possible answer to encroachments on the part of their employers is a strike.[2]

Mr. Fitch again says:

> Taylor and his associates did not try very hard to understand the trade unionists. They appeared to be quite unconscious of the basic historical facts that have made labor movements inevitable, and seemed to think of it as a superfluous and irritating interference with the process of sound industrial management.

I find that these statements, at least as they relate to Taylor apart from his associates, start out to be very inaccurate and wind up by being quite accurate. That Taylor did not try to understand trade unionists and was unconscious of the historical facts that have made labor movements inevitable, is, I am sure, disproved by the quotation from "A Piece-Rate System" I have here presented. But that Taylor came to think of the labor unions he encountered in his day as a superfluous and irritating interference with the process of *sound* industrial management, there can be no possible doubt whatever.

I remember that when I saw him in the summer of 1912 he was, you might say, uncommonly irritated with labor unions. He pitched into them with all the enthusiasm of which his nature was capable—and the Lord knows that was plenty! Well, seeing that he was a human being who had not yet attained to one hundred per cent sanctification, you couldn't feel so terribly shocked. Organized labor's campaign against all things Taylor was then in full cry—and, take it from your old uncle, it was no soft, pretty, plaintive cry, but the cry of those who were out for blood and weren't overly particular how they got it. What had Fred Taylor done to bring this thing upon him? The evidence is that the warfare against him was due solely to the efforts being made to introduce more or less of his management principles and methods into the navy yards and the army's manufacturing arsenals. Now, the management he sought to introduce into these government establishments is set forth in detail in the Taylor biography, and the interference of organized labor with this management is there also to be read. Can any disinterested person examine this record without concluding that the management was, on the whole, pretty sound and that the interference would have been found quite superfluous and irritating even by a less earnest, intense, and peppery person than Fred Taylor?

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[1] Although this article was a letter to the Editor, because of the importance of the content it has been given the form and place of an editorial.

[2] Quoted in the Taylor biography, Vol. I, p. 406.

But what I want to make emphatic here is that when I saw him in that summer of 1912 (my business with him was to obtain material for a magazine article), he was just as vehemently and picturesquely enthusiastic in whacking what he called "damn fool" and "hog" employers as he was in thumping the then existing chiefs of the American Federation of Labor. And he then made it exceedingly plain that his remedy or "formula" for the hopelessly hoggish employer was the big, *striking* stick of unionism.

You may remember the incident in Henry Adams' autobiography where the author told a certain member of the President's cabinet that it had been charged that he, the cabinet member, had not been very tactful in his dealings with Congress. "A Congressman," replied the official, "is a hog; you can't use tact with a hog; you have to take a stick and beat him over the snout." That illustrates Taylor's idea very well in connection with hog employers, and brings us to the essence of his attitude toward labor unions.

He found that the unions of his time were seldom organized for cooperation with employers, but in the main were big-stick, fighting organizations. As such they were very useful indeed for workers who had to deal with selfish and greedy employers. By precisely the same token (as well as by such other tokens as their restriction of output and opposition to the principle of the worker's being paid individually in accordance with his production) he was positive that the unions of his time had no place under scientific management.

It will be observed that I have been careful to speak only of the unions *of Taylor's time*. In this I am but following Taylor's own limitation, as will be seen by this extract from a letter of his (written in 1911) which was quoted by me in the biography (pp. 413 and 414, vol. II), the italics here being mine:

> You realize, of course, that I am not opposed to labor unions. Their proper field *as they now exist* is, I feel, outside of scientific management. I am sure that labor unions (active unions, at least) *as they are now constituted* would seriously interfere with the progress of scientific management.

Taylor, in fine, did not oppose labor unionism under scientific management because of the principle of the thing by itself considered, but because of the particular ways in which he found labor unions conducted. In the letter from which I have just quoted he added: "I can conceive of a union that would be most helpful to scientific management, but I have not yet seen this union."

At the same time, he had the vision to realize that such a union would come. In the course of a discussion before the A. S. M. E., he said:

> I think the time will come when trades-unionists will realize that their true and permanent road toward prosperity lies in so educating themselves that they will be able and willing to do more work in return for larger pay, rather than in fighting to do less work for the same pay or the same work for larger pay.

There is evidence that such trades unions are now, ten years after Taylor's death, coming into being. In the same number of the Taylor Society BULLETIN containing Mr. Fitch's review of the Taylor biography there is a review by Mr. Ordway Tead of "The Women's Garment Workers: A History of the International Ladies' Garment Workers' Union," by Dr. Louis Levine. We here read that this union has subscribed to these principles among others:

> Acceptance by the union of a share in responsibility for getting production.
>
> Use of guaranteed weekly pay rates; but use of payment incentives for work done above a defined standard.
>
> Definitions of fair minimum standards of amounts of work on a basis of careful study of jobs, determination of amounts to take place under joint agreement.

Mr. Tead comments:

> All this represents, of course, a virtual reversal in policy from that of many unions on questions of measured production, use of scientific methods to discover fair amounts of work, willingness to allow the better workmen to earn more than the union scale—in fact, the whole cooperative emphasis in the matter of production.

It is true that the principle of collective bargaining is here retained as regards the guaranteed weekly pay rates, and that the employees have their joint "look-in" as regards the determination of minimum standards of production. And, as Mr. Fitch correctly points out, Taylor in his last years stood against collective bargaining and joint employee action of any kind. Personally I think that this stand showed Taylor's tendency to concentrate on economic considerations to the neglect, not of ethical considerations, but of political. Mr. Robert B. Wolf has said that "no matter how skillfully the management determines the one best way, it ceases to be the one best way if the workman does not want to do it that way." As I see it, determining the best way pertains to economics, while getting the worker to want to do it that way pertains to politics. And I take it that politics never can be wholly excluded in the affairs of human beings, so that the management engineer must be both an economist and a politician. I judge, for example, that Mr. Wolf is a very fine politician, indeed. This aside, it is to be observed that Taylor did not assume his extreme stand against collective action by employees until after it had become plain to him that most of the then labor chiefs were resolved on decorating a sour-apple tree with his shot-riddled body without pausing to find out what he really was up to. His extreme stand, I take it, was largely the reaction of his intense nature to labor's extreme stand; and surely with such a handsome modification of labor's old attitude as is represented by the principles subscribed to by the Ladies' Garment Workers' Union he would have hailed it as a union with which he *could* cooperate and modified his own attitude accordingly.

This much is certain, that the idea should perish that Taylor, like a regular old Bourbon of a capitalist-employer, presented a hard-boiled countenance to all kinds of labor unions and labor unionists. Actually there was not a leading unionist of his day he did not seek to convert. True, he was not his own best converter; but to me, at all events, there was an element of pathos in his warm regard for such labor unionists as William B. Wilson and John Tobin who, mind you, never spoke a single word in favor of his work, but simply refrained from condemning it.

Just one more statement in Mr. Fitch's review which I think needs correcting in justness to Mr. Taylor. I quote:

> . . . he [Taylor] fell into errors of various sorts, and often contradicted himself. For example, he declared in his "Principles" that scientific management has as its "very foundation" the idea that the interests of employer and employee "are one and the same." He thought that the question of the rate of wages could be reduced to a scientific formula, no more to be bargained over than the question of the hour for the sun to rise. But he forgot these theories in the face of concrete realities. When he was promoted to a foremanship over the machinists with whom he had formerly worked, he "told them plainly that he was now working on the side of the management"—a thing that could hardly be said to exist apart or different from the "side of labor," if the principle of identity of interests as confidently set forth above was true.

This implies that when, in 1879 at the age of twenty-three, Fred Taylor became a boss over those Midvale machinists, he had got his theory of scientific management already worked out in his head. Surely Fred Taylor's biography was written in vain if it did not make plain that when he began his career as a boss he was as guiltless of any theory of scientific management as the legislature of Tennessee is guiltless of any theory of evolution. Instead of Taylor's forgetting, "in the face of concrete realities," his theory that the interests of employer and employee are one and the same, it was the concrete realities he encountered throughout his many years as manager and engineer that finally led to his forming the theory. And this leads me to quote once more from Mr. Tead's review of Dr. Levine's book:

> Indeed, if its present program carries on, this union will go down in history as among the very first of those within the fold of the American Federation of Labor to realize that its prosperity and the industry's prosperity are inseparable, and that all the union can do to strengthen the industry will in turn strengthen it.

Is it too much to call this a very strong labor endorsement of the very principle or theory that Taylor said lay at the very foundation of scientific management? And is it not probable that the endorsement also was arrived at, not in spite of concrete realities, but in consequence of them?

One of Taylor's objections to collective bargaining was that a wage is not necessarily a just one simply because it is agreed upon by employer and employees in conference—such a wage, by making necessary an increased price of the product, might very well be unjust to the third party, the whole people, or that element which at the last analysis gives employment to capital, management, and labor alike. Taylor saw, in fact, that the unions of his day often forced up prices by their wage demands; and he feared that any form of collective bargaining would throw the door open to this unionism. But here, now, is a union enlightened enough to see that its prosperity is bound up with that of the industry. Well, then, such a union may be depended upon to recognize that it cannot exact wages which make necessary prices that are discouraging to consumption; and here, as sure as you are born, is more evidence that Taylorism and unionism are not necessarily incompatibles, but may derive great support, the one from the other.

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Improving Department Store Technique[1]

How a Functionalized Department at Macy's Investigates Problems and Plans Methods for Other Departments

By B. EUGENIA LIES
Director of Planning, R. H. Macy & Co., Inc., New York

IT WOULD not be possible to cover adequately in one paper such a subject as scientific management applied to department store practice. I have, therefore, chosen to limit my subject to what a planning department can do to help to introduce scientific management into department store practice. I should like to emphasize "*help* to introduce" because I feel that a planning department is not the only agency through which the principles of scientific management have become known or are finding expression. Such a department is merely a tool of management to assist management to do its job better.

Before pointing out the need for a planning department in a department store it may be well to review the conception of a planning department in a factory, the place where it originated. The department which Frederick W. Taylor originated is an agency primarily for the centralized control of production; that is, it not only devises and establishes better methods of operation, but it also provides for the proper scheduling and routing of work through the plant. A still broader conception of a planning department has been indicated recently by Mr. Keppele Hall, who makes the responsibility of a planning department include "devising methods, forms and procedure for handling *all* the routine procedure incident to the business and seeing that the prescribed routine is followed."[2] This implies planning for the whole business, i.e., for sales, finance, production and personnel. One tri-part idea animates both these conceptions, namely, that of discovery and establishment of better methods, pre-planning work to be done and controlling work as it is being done.

Forward looking department store executives are recognizing more and more the need for such planned and controlled procedure as a means of reducing operating expenses. But in establishing planning rooms they have departed in two respects from conventional factory practice; because of the nature of merchandising operations they have not attempted to establish centralized planning-room control of operations, but have limited planning-room work to research and the discovery and promotion of better methods; and they have hesitated formally to introduce scientific management as such and to employ specialists whose sole purpose would be to put its principles into practice. This hesitation has been due partly to the realization that most engineers and specialists in scientific management have gained their experience in other fields than the department store and therefore cannot be expected to have a thorough knowledge of store problems. It was for this and other reasons that the executive in our store who was responsible for the establishment of the Planning Department preferred to choose persons with the necessary qualifications from within the store to organize and develop the department.

Let us consider some of the major problems which a department store faces in trying to introduce better methods and in trying to increase individual efficiency. One of the greatest problems encountered is variety of work. Few persons realize that there are about twice as many employees behind the scenes in a store as there are in public view. These employees are engaged in occupations which are quite as important to the life of the store as selling. Varied as are the kinds of merchandise sold, and the appeals which must be made to sell it, still more varied are the jobs which are performed before and after the merchandise is offered for sale. First, it is handled by the Receiving Department, where a record is made of its receipt from the manufacturer or vendor and where it is marked and sent either to be kept in reserve stock or immediately to the selling floor. Before its sale is complete, the salesclerk's record of sale—the salescheck—

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[1] Paper presented before the New York Metropolitan Section of the Taylor Society, January 22, 1925.

[2] "The Planning Department as an Instrument of Executive Control," *Bulletin of the Taylor Society,* Vol. VIII, No. 3, June, 1923.

must pass through the hands of a cashier and a wrapper or packer. The wrapped merchandise is then sent to the Delivery Department, where it is sorted and assigned to a delivery route. The driver then conducts it to the customer's door, and that is the end of a cycle as far as the merchandise is concerned—unless there is a complaint! If this happens—and cases are known to have occurred—the merchandise may make a trip back to the store, or at any rate will be the subject of investigation by the Adjustment Bureau, and will also occasion some correspondence carried on by the Correspondence Department. At all events, while the merchandise is being delivered, the Auditing Department will be using the record of its sale in computing the daily totals of transactions. These activities are inevitably a part of the routine of conducting a large distributing business. Other departments have been established to supplement various selling departments, such as the following manufacturing departments: Millinery Workroom, Mattress Factory, Carpet Workroom, Printing Shop, Photo Laboratory, and Picture Framing Department. Still others are needed for the work of building maintenance such as the Carpenter Shop, the Paint Shop, and the Engineer's Office. The coordination of the jobs performed in such a variety of departments to the end that the whole store operate as a unit is a task of gigantic proportions.

Not only does work vary in different departments; very often a great variety of operations of comparatively short duration must be performed on a single job. This is true even after the principle of division of labor has been utilized. Take as an example the work of a marker who attaches price tickets to articles of merchandise before they are sent to the selling departments. At one time, and even today in many stores, a salesclerk not only sold merchandise but marked it also. We, however, have taken the function of marking away from the salesclerk. Furthermore, we attempt to assign markers to certain departments. If we stop to consider the thousands of articles sold in one department, such as the Drug Department, we have some conception of the variety of operations and therefore the difficulties encountered in trying to standardize the job of marking.

A third factor which must be reckoned with in developing standards of performance is the tremendous fluctuation in business. To be sure there are certain periodical fluctuations which can be prognosticated. These would include a daily peak between the hours of 11 and 4, a weekly peak on Saturdays, and seasonal peaks at Easter and Christmas. By a careful analysis of past performance one can note with increasing accuracy where these peaks occur and can study their behavior. But in a merchandising business there will always be many valleys and peaks of which we can have no warning until they are upon us. These are caused by such uncontrollable factors as weather and style of merchandise.

The fact that many of the employees are in direct contact with our customers increases the difficulty of the problem and makes it imperative that we instruct our salesforce not merely in the mechanics of their job but also in the psychology of salesmanship.

All these factors make the work of determining standards of production for so many jobs more difficult. We have not found a solution for all cases, but we have gone far enough in our studies to recognize certain principles. In order to measure performance when so many operations are involved that it is impossible to set a separate standard of production for each, we attempt to find a common denominator of work. Where the fluctuations in the amount of work received or other conditions of work cannot be controlled, we measure average performance over a period of time against the standard set.

The function of our Planning Department is that which may be attributed to any agency of scientific management—in Mr. Leffingwell's[3] phrase, "to standardize policies, methods, equipment and tools." Our method of attack is to standardize procedure, supervise its installation and finally to follow up after the installation has been completed. We maintain these three well defined divisions of any piece of work, as they insure a comprehensive grasp of the problems and a check-up on progress made. For illustration, we make job analyses, to furnish the employment and training departments with job specifications, and to develop with these departments promotional plans and a standardized wage scale after the operations of the job have been standardized. In addition to the study of the individual jobs, an analysis of the relationship of one job to another is made in order to determine the most direct routing of work and the best layout of the department as a whole. The equipment—chairs, desks, tables, files, etc.—and the condition of work, lighting and ventilation are studied also.

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[3] "The Application of the Principles of Scientific Management to the Office," *Bulletin of the Taylor Society,* Vol. VII, No. 1, February, 1922.

In contradistinction to the planning department in a factory, which is in important respects an operating department, our Planning Department occupies a purely staff position in the organization. It acts in an advisory capacity to the management and more especially that representation of the management which is called the Board of Operations. This body is composed of the Vice-President of the organization, the General Manager, the Controller, the managers of the larger non-selling departments and the Director of Planning. The Planning Department is closely associated with this board so that any problem of operation which might need investigation or study can be referred to it. Recommendations resulting from such investigations are referred to the Board for approval. The Planning Department is directly responsible to Mr. Percy S. Straus, Vice-President, who is the chairman of the Board. It is our good fortune that Mr. Straus possesses qualities as an executive which make him unusually sympathetic with our aims. He is continually eager to replace what he likes to call "rule of thumb" methods with "the best" methods. As this desire is coupled with a thorough and intimate knowledge of every phase of store operation, his concern with our problems is a continual stimulus to greater effort.

Only with such an appreciation and understanding on the part of the owners and managers is it possible for an organization to derive the greatest benefit from planning of this kind, since it is at best hardly through the stage of pioneering and experimentation. We must not omit to say also that the cooperation of all the operating personnel, from the General Manager himself to the employee on the least important job, has been an indispensable factor in whatever success we have had. In fact, we like to think of the personnel of the Planning Department as including every individual in the organization, with our staff as those selected to devote more time and thought to specific problems because they are not interrupted by the many immediate operating duties. Our conception of the Planning Department's primary function would be, then, that it is educational to the extent that it is trying to get the organization to think more and more in terms of "what has been accomplished in the course of a day or week," instead of in terms of "the number of hours or days or years that an individual has been present in the organization."

In discussing one or two specific problems which have been assigned to the Planning Department I shall not attempt to describe our methods of attacking each one individually. I shall rather limit myself to a statement of the problem and its solution.

One of our earliest assignments arose from the desire on the part of our executives to compensate our non-selling employees, in addition to their weekly salary, by some means which would be comparable to our commission payments to selling employees. At this time we were thinking of a non-selling bonus in terms only of attendance, punctuality, personal ratings and other factors not directly pertaining to production. After much thought and discussion it was decided that any kind of a bonus payment should be limited to a payment on production measured against standards of work set for each job. This was a new principle in the payment of such employees, and its acceptance made it necessary for us to discard the general attendance and punctuality bonus then in use. But in order to avoid the feeling in the organization that we were even indirectly reducing wages, we introduced a compensating more liberal vacation plan, which in dollars and cents would cost the organization just about as much as the bonus had cost.

The determination of the vacation plan best suited to our needs was the responsibility of the Planning Department. We carefully studied a number of plans already in operation in this city and elsewhere, both in department stores and in other types of business. On the basis of these and with an understanding of our own needs gained through study of the local situation from all angles we were able to present alternate plans, one of which was finally adopted.

To digress a moment, let me utter a word of caution on the subject of bonuses. While we have decided upon what basis they shall be paid, we are at present paying bonuses on only a very few jobs. Our reason for this is that the process of working up standards is necessarily a slow one, since it involves the preliminary steps of standardizing methods, routing and equipment. Even after these steps have been covered we still have to meet conditions like fluctuations in the amount of work received and other variables which are beyond the control of the management and the worker, before a standard day's work for each job can be determined. Accordingly, it is absolutely essential to proceed with great caution. We can report progress, but in some ways we have been brought nearer to barriers which appear more difficult to surmount close at hand than they did from a distance.

Another problem on which we have worked is the centralization and improvement of our personnel control record cards. We have no Personnel Manager in our store; we have, however, an Employment Manager and a Superintendent of Training, both of whom are responsible to the General Manager. For this reason we have always had an individual personnel record card in the Manager's office. This card was in a vertical file, and furthermore was not designed in such a way as to furnish a quick and all-inclusive understanding of the employee's record in the organization. For instance, it was not possible to obtain up-to-date information on the employee's error record without wading through a number of error slips which were enclosed in the folder. There was also a duplication of records in the Employment and Training Departments. We found that it was possible not only to design a card which would include all the information desired, arranged in such a way that almost at a glance the executive using it could know all the facts, but also to use a visible index file in which daily postings of records could be made with much greater ease. Furthermore, by using a special type of visible index equipment, we were able to file our references and application blanks in the same file with the active card. Thus we avoided a double file often felt necessary with a visible active card.

I have already mentioned the fact that the Planning Department is responsible not only for investigation of a present method and the determination of a new best method, but also for the supervision of the installation of the best method. In our experience it has worked out that this second step is very often of longer duration and more difficult than the first. The installation of these personnel records proved to be a good example of this. About two months only were taken to decide what was wanted, but it took one member of the planning staff and the supervisor of our Record Room many months to introduce the new cards and to devise a control of the work which should insure the receipt of *all* records and a check-up of the performance of the individual clerks keeping the records. To meet these needs, control boards were introduced, but only after the Supervisor had asked for them. Because they were introduced in this way, she considered them an absolute essential rather than one of those "extra jobs" with little or no value.

A third and, because time is limited, last illustration is that of the work of the Planning Department in connection with the new building. This illustrates the work of the department in routing and scheduling operations, though the opportunity of applying these principles to work on a new building, the example given here, may occur only once in a great while.

We have just recently completed the erection of a new nineteen-story annex containing approximately 500,000 square feet of floor space. Our old building is a ten-story structure in which we used the basement, first six floors and eighth floor for selling, and the subbasement, seventh, ninth and tenth floors for nonselling. The task of planning the new building was complicated by the fact that we had also to re-arrange the old so that the old and the new could form one operating unit. This meant, of necessity, that our moving schedule would have to be a prolonged affair and that careful forethought would be required if the moving was not to interrupt our daily business. The task was so tremendous that it was decided that one of the members of the firm should devote himself exclusively to guiding the work. This was Mr. Percy S. Straus.

I have already mentioned the unusual insight into department store problems possessed by Mr. Straus. This quality does not confine itself to problems of routine management alone, but has been manifested in his grasp of the architectural and building point of view. I should like to repeat a statement made by Mr. Otto Eidlitz, our builder, that without any question the Macy job has been the most difficult ever encountered by their organization, and that it was only Mr. Straus's understanding of the connection between building problems and store operation that made it possible to carry on. The Planning Department was detailed to assist Mr. Straus in this work.

Before describing more specifically just how we functioned I should like to point out some of the major problems which a store of our size faces in planning a new building:

1. There is the problem of traffic, that is, traffic of customers, merchandise, and employees. The figures for these three most important quantities in the operation of the store run pretty high. An actual count of the number of people entering the store on the second Saturday of November of 1924 showed 66,748 people between the hours of 11 and 5:30. This day, it must be remembered, was a day of normal Saturday business, and not comparable to a Saturday during the Christmas rush. The maximum number of packages we receive from manufacturers and

vendors in any one day during the Christmas season reached close to 1900 and the number of employees was approximately 10,000. With these large masses of humanity and material to handle, one faces a complicated task, since it is as important for the forward stock of merchandise to flow freely to the selling fixture and the employee to reach her selling location or office without delay as it is for the customer to circulate freely on the selling floor, or to travel with ease to other floors.

2. The location of selling departments requires careful thought. The difficulty encountered is to keep related departments together on the same floor. For instance, all women's wear should, in the best arrangement for selling, have its separate domain. This is true also of children's wear, or home furnishings, or other departments which are related one to the other.

3. The design of fixtures claims a great deal of time and attention. It is a job fraught with endless details to design fixtures which are adapted to the great variety of merchandise sold in all the departments. The differences between umbrellas and underwear, shoes and cigars, blankets and bathing suits are intensified when one considers them from the point of view of the fixtures in which they are to lodge. Indeed, often in a single department the great number and variety of items sold make demands on the best ingenuity of the designer. Notions and artists' materials are examples of such departments.

4. The layout of non-selling departments is a very important consideration. These departments must be located with a view to their convenient use by the entire organization and must be planned so that their work can be routed most efficiently. For instance, the marking and stock rooms should be located as conveniently as possible to the selling floors, and the equipment in the rooms should be so placed that the merchandise will travel as direct a route as possible from the receiving point to the selling floor.

We do not mean to imply that these problems were solved by the Planning Department single-handed. On the contrary, the many technical questions of architecture and engineering were handled by architects and engineers. In the case of the selling fixtures, special fixture architects were employed. But our work was the establishing of contacts between the architects and builders on the one hand and the operating executives on the other. Because of our acquaintance with the store system and problems, we were able to interpret the store point of view to the technical men, and having learned from the architects their point of view, we were able to convey it to the store in its own terms. As a matter of fact, we worked with the architects directly in the layout of selling and non-selling departments. We were also called upon more specifically, as I have already mentioned, to assist Mr. Percy S. Straus in planning for the new building, and in the issuance of instructions to the architects and builders. Furthermore, it was our responsibility to work with all concerned in the scheduling of the moves, and in supervising these moves and the installation of equipment.

A more detailed explanation of how one of our major layout problems was handled—that of merchandise traffic—might make what I have been saying more concrete. I shall attempt to show you by referring to these plans[4] the route that merchandise takes from the time it is received at our receiving platform on the street to the point where it is loaded on our vehicles for delivery to the customer. The receiving platform is located in the northwest corner of the west building. Merchandise is received here and sent to the tenth floor, which is the main receiving floor, small packages via conveyor, large packages via elevators and loads of merchandise via "Jumbo" elevators (that is, the entire vehicle is lifted to the proper floor and unloaded there to avoid double handling). From the receiving point on this floor it is trucked by motor car to that part of the Marking Room nearest the reserve shelving designated for the particular merchandise. Here it is unpacked in one aisle and placed on the marking tables. These tables have been designed in such a way that trucks will fit under them, to receive merchandise as the marker marks it, thus eliminating another handling. I should like to mention parenthetically that we have standardized the type of work chair for this job as well as the type of table and truck. As trucks are filled they are wheeled either into the reserve aisles which are adjacent to the Marking Room or directly to the Utility Units. These units, of which we have six in the store, are made up of an elevator and spiral chute. Merchandise is sent from the Marking Room or Reserves to the selling floors via these units. In laying out our reserve aisles and selling floors we have tried to locate the reserve of any one department immediately over the selling department itself, so that there should be as little handling as possible to get to and from the unit both on the reserve floor and on the selling floor. From the outlet of the elevator or chute on the selling floor the merchandise is taken to the selling department. After the merchandise has been sold and wrapped, it is taken again to these service chutes, to be sent down, via another blade, to the Main Sorting Table in the basement. On all floors above the first, the merchandise is taken by a collector to the unit, but on our first floor we have the various merchandise checkers' desk in the various selling fixtures connected with conveyors to our Main Sorting Table. This helps to eliminate at least one source of congestion on our most crowded floor.

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[4] It is not practicable to reproduce the large and detailed blue prints by which this part of Miss Lies's paper was illustrated.

At the Main Sorting Table the package becomes the property of the Delivery Department. In the Delivery Department are two underground driveways, one in the basement and another in the sub-basement of our new west building. Each of these driveways has two platforms, corresponding to certain large zones of the city, which are connected by conveyors and chutes with the Main Sorting Table. After the package is received at any one of these platforms it is again sorted into the individual Entry Clerk's Route Bin. Here the necessary entries are made and the package then placed in the driver's bin. These drivers' bins open out on a platform against which the driver backs his truck in order to load. After loading has been completed the vehicle is lifted to the street via one of four "Jumbo" elevators. Thus you have seen the complete route taken by a piece of merchandise from the time it enters the building until it is carried out.

Before closing I should like to take time to give an example of one of the most complicated moves which had to be made. This move involved the installation of fixtures on the first floor in the old or east building.

The work to be done involved:

1. The clearing of space, which meant temporary moves for most departments. These had to be scheduled and arranged for in the same way as permanent moves.
2. Removing old fixtures, ventilating ducts and conveyors.
3. Preparing the cleared space for fixtures, that is, doing the necessary electrical work for lighting showcases, conveyor work for carrying wrapped merchandise to the delivery department, ventilation work in accordance with our general ventilation system, and pneumatic tube work for conveying money to the central tube rooms.
4. The installation of new fixtures. This also meant a close follow-up of the forces engaged in completing the installation.

In order to have the proper control and to have the move completed in the time set, schedules were prepared which listed every move to be made and the various persons responsible for each step of the move, together with the starting date and the finishing date. In conjunction with this schedule we prepared a floor plan on which the moves and the progress of work were represented graphically. This made it possible for us to survey the situation as a whole and to guard against or overcome, by summoning an increased labor force, any delays which might disrupt the whole schedule. This floor in its entirety was changed between the Fourth of July and Labor Day. When one stops to consider that it took between ten and twenty days to complete the work in any one section, that thirty departments were moved, that an area of 59,000 square feet was in work, and that selling operations were not interrupted, one readily understands that the task was not an easy one.

There are many things that might have been said if there had been more time. However, I am particularly interested in emphasizing one point which I hope ~~has already~~ been made clear; and that is, that what we have done is not, we feel, a record of complete accomplishment but rather a statement of the general principles which underly our work and of some of the specific things we have accomplished during our first five years of pioneering.

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Management Problems in the Automotive Industry[1]

Distribution Replacing Production as the Dominant Factor

I. By HARRY M. JEWETT
President, Paige-Detroit Motor Car Company, Detroit

II. By JAMES H. COLLINS
Merchandising Director, Chilton Class Journal Company, Philadelphia

I. By HARRY M. JEWETT

NO OTHER industry in the world has attained the rapid growth of the automobile industry. There is a reason why. It was a demand for quick, efficient and economical transportation which forced the automobile industry to the pinnacle it holds today.

Is its position secure? I believe so. The development in this country in practically every section is continuing. More and better roads are being constructed. The increasing wealth of the country is increasing the demand for automobiles.

At the close of 1922 I was talking with a leading New York financier who said that the automobile industry would be one of the last to get on its feet because it is not an essential. The facts are that it was the first to regain its equilibrium and forge, ahead to record-breaking production. The financier was wrong. The automobile is an economic necessity. Efficient, flexible transportation is more necessary than any other product of industry.

The future world's absorption of automobiles, I believe, is beyond our comprehension today. American manufacturers absolutely control the automobile industry in the world because of the economic advantage of enormous home consumption with resultant quantity production and efficient manufacturing methods.

As the world outside of America progresses and, growing wealthier, demands more and better roads, the foreign demand will increase and American manufacturers will be there to supply it. The growing volume of exports in our industry proves our present day ability to supply the world.

Conventional methods of management in an industry growing with such tremendous strides have had to be cast aside and more efficient methods developed. At least 75 per cent of administrative brains were until recently used in the perfection of manufacturing methods. For instance, a few years ago we could obtain 45 good cylinder castings per day from a pattern. Today 285 good cylinders per day is the production. The old-fashioned method of assembly of automobiles in a stall has passed and the wonderfully efficient progressive assembly is in vogue.

Within the past three years the public has demanded enclosed cars, and from 35 per cent closed car production the industry will go to 75 per cent in 1925. Progressive methods of assembly and production of enclosed bodies have brought down the price to the point where the public can afford to purchase the closed type. We scrapped a $100,000 enameling plant for one in which production was trebled and cost was lowered 33 1/3 per cent.

It has taken courage, good judgment and the casting aside of the ordinary conventional business management to keep forcing an increased demand and keep pace with increased demand by lowering costs to put needed transportation in the hands of every one.

I said 75 per cent of administrative brains have in the past been put into manufacturing. Today the wise administrators are dividing the brains of management between sales and manufacturing. As we develop into a buyers' market this change will be more and more in evidence.

A buyers' market and intense competition are now in evidence. There have been approximately 975 makes of automobiles placed on the market. At the New York Show in 1923 there were 113 exhibitors. In 1924, 71; in 1925, 52; and I predict in 1926 between 40 and 45. The weak and inefficient are falling by the wayside. Larger production in fewer plants is indicated.

The distribution of automobiles at the inception was largely by bicycle dealers, augmented by a sprinkling of sons of wealthy parents and others brought into the whirlpool of distributing a commodity that every man, woman and child wanted above all else. Manufacturers have not paid proper attention to this important branch of the industry. When one dealer succumbed, another was there to take his place. But as the changing conditions have developed, the manufacturer has taken heed of his danger and is cooperating more closely with his dealer and devising methods to put him on a sounder business basis.

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[1] Two papers presented at a meeting of the Taylor Society, Ann Arbor, Michigan, May 15, 1925. Mr. Jewett's paper is in abstract.

There are many methods used in distribution. Some manufacturers distribute solely through a dealer with small territory, others through branches and distributors of varying sized territories. All methods may be successful—it depends really on the quality of the representation. However, the tendency is to give smaller territory and have closer supervision over the dealer. The average automobile dealer is a poor business man. I might say the same of any industry. The automobile manufacturer must teach him better business methods.

Some years ago, appreciating this fact, I had an accounting system developed by one of the best accounting companies in the country and put an auditor on the road to try it out. I soon found out I had a difficult task, as no dealer wishes to acknowledge he is not an efficient business man. However, I did find that one of our largest distributors had not closed their books in eighteen months. They knew they were not broke as they had in the banks a balance sufficient to pay all debts. After some persuasion we installed the system, and today they are one of our most successful distributors—a splendidly conducted establishment.

We are now installing the system as rapidly as possible in our distributing organizations. We have a system adaptable to any size business, and trained auditors to install it. The auditors, by comparison between dealers with practically the same volume, can advise with them how each department of their business should be conducted. One manufacturer has spent over $250,000 on a like system and finds it money well spent. The wise manufacturer will be very careful in the future how he forces out cars beyond the dealer's capacity to absorb, for this weakens the dealer and forces him to take long trades on second-hand cars with corresponding losses.

Producers are also helping distributors by analysis of the market. By keeping track of registrations of automobiles in each country in the United States each month, which can readily be done, each manufacturer can define the opportunity and determine the quality of each of his representatives, and thus develop distribution on a sound basis.

The automobile industry is settling down. Production methods have been brought to a high state of efficiency. In the future the manufacturers must devote more attention to distribution. He must improve his selling methods, and especially he must help his dealers to improve their selling methods. We think our biggest job is to help our dealers be more successful business men.

II. By JAMES H. COLLINS

PROBABLY no industry has passed through so many phases of business evolution in so short a time as has the automobile industry. A normal history of fifty years has been crowded into a short decade, in fact, into little more than half a decade.

No other great industry has built up so universal a public demand in so short a time. Few if any other industries have witnessed so many engineering and style changes in the span of a few brief years. No comparable national sales organization has been established in so short a time for any other industrial enterprise. No other business has had to develop such nation-wide service machinery to insure continued public interest in the product. The automobile business from the outset has been described and discussed in superlatives, and consequently its history is more highly colored, and its current problems of management and administration more varied and more complex, than is the case with industries whose commercial development has been more gradual.

For ten years, with the exception of a few brief interludes of minor depression, the automobile industry has been building cars to meet an increasing and practically a spontaneous public demand. This public demand has been so well sustained that the need for a more intensive form of selling has not manifested itself until quite recently. Therefore, the change from a seller's market to a buyer's market finds the automobile business with a whole new set of problems to face and little experience to serve as a guide.

The subject for today's discussion can be approached from a number of angles. Production methods will assuredly be influenced by changing market conditions. Buying practices will be adjusted to meet new competitive factors. But more important than both of these, and of more vital significance to the industry as a whole, will be the problems of management as they relate to the development of retail sales.

Perhaps it might be well at this point to cover certain basic facts that must be considered by executives who are today preparing plans that will suffice, not only for tomorrow but for next year—in fact, for the next five or ten years. The automobile industry is America's greatest manufacturing enterprise, and a day-to-day system of planning will not permit past gains to be consolidated and advanced. Today's plans must be part of a permanent program, not designed merely to meet current conditions. The automobile executive, therefore, needs to marshal his facts more fully perhaps than does the management of almost any other business. The history of his industry is briefer and its rate of movement is more rapid.

Price Changes and Their Effect

The past five years have witnessed the advent of the era of real competition in the automobile business. The age-old struggle for the survival of the fittest began to be manifest as soon as the industry was established on a sound commercial basis, and has grown keener as the demands of the buying public have grown more exacting.

One of the most noteworthy features of the era of sharper competition has been the downward revision of all list prices. In this movement the stronger companies have taken the lead and the smaller companies have been forced to fall in line. Today we talk of the millions of cars made annually, but an overwhelming percentage go to the low price market.

In 1920 passenger car output totalled 1,883,158 units, and of these 59 per cent sold for $1,000 or less. Last year 3,243,285 passenger cars were built, and 78 per cent of these were in the class selling for $1,000 or less; only 22 per cent sold for over $1,000. During the present year the production of passenger cars should be about the same as for last year, and the percentage of cars selling in the lower price levels should exceed by a slight margin the percentage of these cars produced last year. The low priced car has acquired a permanent position of dominance in the industry insofar as volume of output is concerned.

As might be expected, constantly decreasing prices have greatly stimulated public demand, and production schedules have reached totals never dreamed of ten years ago. This great output in turn has been passed on to the national dealer organization for final sale, and it is this division of the automobile industry that now deserves the major part of the attention of the best executive minds in the business.

Some figures may visualize the problems which now engage the attention of the national dealer organization.

The number of car dealers has increased more than 45 per cent in five years. Likewise car production has climbed by leaps and bounds during the same period. At first glance it would appear that the great increase in car output would have resulted in a great increase in the business of the dealer organization, and in one sense of the word it has.

Considering the matter from the viewpoint of the number of cars sold, we find that Ford dealers sold an average of 108 cars each in 1920, dropped off a trifle in the low years of 1921-1922 and then climbed to an average of 130 cars per dealer in 1924 with prospects of an equal volume of sales this year. Other car dealers averaged 36 new car sales per dealer in 1920, and reached a total of 46 new car sales per dealer in 1924.

Turning now to sales in terms of dollars, we find conditions somewhat different. Over a five-year period car sales per Ford dealer have held to a fairly consistent level, ranging from a low mark of $57,360 in 1921 to a high mark of $76,718 in 1923, and maintaining a level of more than $75,000 per dealer for the past twelve months. Conditions, however, have not been so good in the case of the car sales of all other dealers. Such car sales per dealer in 1920 averaged $59,425. This figure dropped to $29,625 during the depression of 1921, climbed to an average of $51,344 in 1923, and for the past twelve months was only a trifle over $40,000.

The prosperity of the car maker is tied up permanently with the success or failure of the retail dealer organization. The above figures suggest the car dealer's problem—to handle a greater number of units, bringing in a smaller gross income. How can this be done? By cutting needless sales costs. By adding supplementary lines of parts and accessories to bring up the gross revenue. By canvassing local markets more effectively. By checking trade allowances carefully.

These problems, you say, are dealer problems. But if the dealer fails to make his profit, he becomes a liability to the car maker, and hence we are safe in stating that the best sales executives in the ranks of the car makers must come to regard these problems as their own, and must join with their dealers in working out a solution.

Increases in Productive Capacity

The relation between factory capacity and market demand offers food for thought to the factory executives.

In 1923 the public demand for automobiles topped all records formerly set by the industry. The principal makers, almost without exception, were working at full speed on back orders and many manufacturers felt that lack of proper facilities for increasing output resulted in fewer sales than could have been made. The inevitable result was a program of building and expansion.

At the outset of 1923 the industry's capacity was sufficient for an output of 4,300,000 cars and trucks. The actual output for the year was 4,086,997. At the beginning of last year factory capacity had been increased until it was sufficient for an output of about 5,600,000 cars as compared with an actual output during the past twelve months of 3,617,602 motor vehicles. The slackening of demand for automobiles during the spring months of 1924 forestalled any additional increase in factory capacity, and the industry has come to the current year with a factory capacity sufficient for an output of approximately 5,650,000 motor vehicles. From present indications the percentage of this factory output that will be utilized in 1925 will be about the same as for 1924 unless the market shows a strength which has not as yet manifested itself.

These figures show that factory capacities in many instances are temporarily in excess of current demands, and this in turn throws on management the burden of keeping down production costs and general overhead, while at the same time building a public demand sufficient to utilize a greater percentage of production facilities.

The Changing Dealer Organization

Turning back again to the industry's retail sales machinery, we find some complications which now face management as a result of the rapid growth in the number of retail outlets for automobiles.

Records for the past few years show the following growth in car dealers:

1920	32,245	1923	38,592
1921	35,373	1924	48,216
1922	35,337	1925	48,151

An increase of 45 per cent in five years in any national sales organization is certain to carry in its train a number of serious complications. Frankly, the dealer organization has been suffering from "growing pains." It has been impossible for the industry to add 15,906 units in five years without some fatalities. One of the most costly drains on the purse of the car makers has been the direct results of dealer mortality.

In 1920 about 13 per cent of the car dealers went out of business. In 1921 the percentage had increased to 21. In 1922, 25 per cent of all the car dealers went out of business. In 1923 dealer mortality climbed to the astounding figure of 26 per cent. Present records show that mortality during 1924 was about 21 per cent.

The most significant fact in this connection is that the highest dealer mortality was coincident with the greatest output of motor vehicles. If we are to judge from 1924 figures, we can assume that, for the time being at least, dealer mortality has passed its crest. The low rate of mortality for the past twelve months suggests that a greater degree of stability has been established in the retail trade.

This mortality has affected alike both manufacturer and distributor: the manufacturer on account of the great cost of replacing defunct sales units; the established dealer because of unsettled trade conditions and credits.

One of the most hopeful signs for prosperity at the outset of the present year has been the substantial decrease in dealer failures for the last twelve months.

Most of the leading car makers are facing and conquering this problem of dealer failures. Other industries have in some cases shown a higher percentage of dealer failures, but the automobile dealer is commonly rated as a leading business man in his community and the records cited above are too high for this substantial type of business.

Automotive executives must continue to offset this mortality record through exercising greater care in the selection of trade units, and through cooperation with dealers in working out economies and developing additional sources of revenue.

Again we repeat—the success or failure of the automobile manufacturer will be founded on the success or failure of his dealers.

Used Car Sales and Their Effect

The biggest retail selling problem facing the industry today is that of clearing used car sales. More losses have been sustained through improper trading than through any other form of business error. When we remember that there are 15,460,649 registered passenger cars in the United States today, or about one for each two families, the prospects for many future sales not involving a "trade in" seem rather remote. The car dealer cannot hope to find each year an increasing number of buyers who are entering the market for the first time. He is learning to make more and more of his sales to customers who wish to turn in old cars, and he must show a profit, not only in new car sales, but on resales of old cars.

In a recent survey, twenty-five typical Eastern dealers selling well known makes of cars reported 1924 sales involving 5,123 new cars and 4,349 used cars; fifty typical Middle Western dealers reported 1924 sales involving 10,850 new cars and 13,208 used cars.

These figures, if accepted as typical, show that dealers today are selling more used cars than new cars. The effect of this can be illustrated by the actual experience of a well-established dealer selling a popular make of car. In 1924 this dealer sold 400 new cars and 300 used cars. His *gross* margin on used car sales was $765, but his *net loss* on these sales, after deducting all expenses, was $13,000. His average sale per new car was about $1,000. If we assume his net profit per new car to be 5 per cent, his used car *losses* were equivalent to net profits on about 260 new car sales. Under the circumstances his financial showing for the year was unsatisfactory, and the answer rested with his used car department.

The concern of the factory executive is this; where the dealer is selling more used cars than new cars, his interest is divided and his energies dissipated. He is serving as the representative not only of the car for which he holds the agency, but also for all the other car makers whose used cars are being sold through his establishment. A real problem of management for automotive executives will be the development of ways and means for cooperating with the retail sales organization in minimizing the troubles arising from faulty trading practices.

Extent to Which the Market Has Been Developed

Finally we come to a consideration of the basic condition of the market for new cars. More than one and a quarter million cars were scrapped last year and were replaced. Within two or three years the number of cars scrapped annually will be over 2,000,000. This will clear the market for a substantial number of new car sales.

But how many *new* buyers can we expect to enter the field in the next few years? The record of new buyers for recent years has been as follows:

1920 1,666,495
1921 1,231,254
1922 1,775,080
1923 2,853,802
1924 1,981,000

More than nine and a half million new buyers have thus come to light in five years. Such a rate of increase in the size of the car buying public cannot continue indefinitely. Already the number of those entering the field each year for the first time is beginning to show a drop.

It will be a problem of management during the next few years to establish a proper production schedule to synchronize with retail demand and to help the selling organization readjust itself to changed conditions where the bulk of buyers will not be entering the market for the first time.

Conclusion

The automobile industry is gradually passing from the era of development to the era of stabilized merchandising. Engineering practices and production methods already show unmistakably the effects of stabilization. Production costs have been reduced so drastically that today the automobile manufacturer seems to have justification for his claim that he is offering more for the dollar than any other industry.

There is one place, however, where the car maker still has a major problem before him. That has been the reason for stressing sales statistics in this discussion. For five years the industry has been reducing manufacturing costs and cutting down on production wastes. The next five years will be given over quite largely to reducing the costs of distribution.

Management's greatest task in the next period of development will be to establish closer contact with the retail selling organization, and to make factory direction a real influence in building future sales.

The automobile business has grown in a few short years to be America's major manufacturing enterprise. Continued wise supervision of national sales effort will entrench the industry in the enviable place it now occupies in our national commercial structure.

658.9:629.1

Frequency of Change of Automobile Models[1]

Frequency of Design Is Not in the Interest of Economical Production, Efficient Distribution or Consumers' Well-being

By **T. J. LITLE, JR.**

Chief Engineer, Lincoln Division, Ford Motor Company, Dearborn

AS AN engineer, you may expect me to limit my remarks to the fundamentals of design as correlated with economical production of the motor car. With particular reference to frequent design changes made necessary by constant development as a result of research and invention, the problem is not so simple as it would first seem. It becomes very much involved, and economics not only of production but of merchandising as well must be seriously considered, particularly in regard to the effect on the buying public and the dealer organization.

Last September I was asked to address the Society of Automotive Engineers at the opening of the season's activities in Cleveland. I chose my own subject. And I shall in the course of this paper reiterate some of my arguments against yearly models. Engineers seldom discuss subjects of this kind, but I think it high time that they do so, because on them very often lies the responsibility for too frequent changes.

In merchandising many manufactured products it has long been the practice in America to stimulate sales by frequent changes in design or style. Such changes are usually seasonal. With the less expensive of our necessities this scheme has been quite successful; in fact strikingly so in the millinery and haberdashery trades.

As we progress into higher price merchandise, such as the clothing trade, we find the merchants attempting to pursue the same policy, but as a greater investment is involved the average American notwithstanding his wealth balks at discarding a suit which is only partially worn out. We shall admit, of course, that some of the elite discard clothes after wearing them only a couple of months—consider them hopelessly passé.

To him who follows the artistry of the high powered wielder of the brush painting fashion plates in his New York studio it seems to be a tragedy not to be arrayed in perfect form continually, and his only worry seems to be that he cannot effect a trade-in on his used clothes when purchasing the new ones—the clothing industry has not been so highly organized in this respect as the automotive industry, and the pawn broker has never given a fair deal.

Americans as a class cannot be considered silly faddists. In other lines of trade, covering necessities of life, the seasonal changes of style have not been in vogue. The styles in furniture and other household necessities do not change so frequently.

With respect to the manufacture and sale of the automobile, which has long ceased to be designated as a pleasure vehicle and is now considered a means of transportation, I draw your attention to the fact that it is quite necessary that its form be changed or modified to keep pace with the rapid mechanical development. In the newest of our great industries it has, however, become almost a universal policy to change the automobile models every twelve months. It is against that policy that I wish to address you.

When the management decides that it must have a new automobile by the first of January, a great burden is suddenly imposed on the engineering department. The boards are swept clean and the new design is started with a rush. Sometimes only a few months elapse between the laying down of the design on the board and the production of the first model. An attempt is usually made to keep the work secret, which greatly hampers the proper testing of the power plant and chassis in any but experts' hands.

The shrewdest engineer cannot fail to make many mistakes in this hectic rush for production, but the industry has become so accustomed to the making of mistakes that it takes them as a matter of course. And knowing that the mistakes will be corrected later, they have gotten away from acknowledging a corrected mistake and now always call it an improvement. In fact, improvements of this character make it easier to create another model in the following year.

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[1] A paper presented at a meeting of the Taylor Society, Ann Arbor, Michigan, May 15, 1925.

Of course, the intense secrecy exists only in the mind of the management, for we always know all about the other fellow's new models before the advertising campaign is launched. This advertising campaign, by the way, has of late years savored strongly of circus methods.

The engineer in my estimation is responsible not only until the time of the completed design, but really for a period of several years following; in fact, until the vehicle has ceased its useful life.

Reverting for the moment to other transportation activities, we do not find, for instance, that the styles are completely changed on railway coaches, Pullman sleeping cars, or locomotives—there would be, you would say, no sense in changing them. Neither is there sense in changing automobiles so radically as we do change them.

Another great difficulty encountered in the hectic rush for the yearly model is that invariably plans are switched at the last minute because of some brilliant inspiration sprouted in the mind of some executive, which promises to prove a knock-out in the coming advertising campaign. That usually results in operating the engineering department on night shifts in the hot weather. And precisely the same thing applies to the tool department, for the tooling up of a great plant for a new model is an immense task, involving in one plant I know an expenditure of $3,000,000.

Some engineers seem never to be happy unless they can redesign the power plant at least once a year. Consequently companies following this practice never can expect to refine their product, for in all my experience I have never yet seen a really good automobile produced in less than three years' time.

Aside from the physical difficulties encountered in the engineering and production departments, I believe that this yearly model policy is economically bad. Production methods are never developed as highly as they could be were the model to remain unchanged over a considerable period. A great economic waste is created when a plant is shut down during the tooling up period for a new production. As the management is hardly willing to maintain a pay roll of idle men, many skilled mechanics are lost during this period. They prefer to work in plants where employment is constant. When the plants do start, however, they have to make up for lost time; consequently many green men are employed and resort is had to night work.

Another great weakness enters in the sales department, where salesmen are found sitting behind their desks because they are afraid to go out to interview the public. The rumor that a new model will soon be out has become public and the salesmen dare not face such a prospect. Then when the new model does appear, dealers find themselves with unsold cars of the previous model, and, resolutions to the contrary, prices are cut to move the stock. Also in winding up the production of the old model, many finished parts are left over. These are usually put aside for service stock, but much raw material is scrapped, which, of course, is a direct loss.

After the new model, which is perfect according to the advertising campaign, has been in operation in the hands of the user for a few weeks, many annoying complaints stream in. Quickly a large number of men are rushed to all parts of the country to study the complaints first-hand, for no factory dares trust its local service station implicitly because they fear it has not as yet become sufficiently acquainted with the new device. After these complaints have been investigated, structural weaknesses are usually found, which necessitate design change and consequently production change.

The production lines are frequently held up until the changed parts can be placed in assembly. These are the things about which the public knows very little, but which it nevertheless pays for dearly. The production curve of the average factory is anything but a straight line, and dips produced by causes just enumerated are sharp and deep.

A great economic waste is suffered by the consumer because of artificial depreciation resulting from obsolescence caused by these frequent design changes. This is absolutely proved by carefully analyzing the second-hand value of cars brought out by companies who habitually change their models yearly, as compared with those of companies who do not do so. People are now beginning to appreciate this fact. Furthermore, it works a great hardship on the dealer, for he cannot conscientiously allow as advantageous a trade-in as he could if the car had not been obsoleted by the yearly designer.

Another great difficulty directly caused by these frequent design changes is the fact that it is necessary to carry such a multitude of parts for servicing successive models. Where an adequate stock is carried, a very large financial burden is placed upon the dealer. The tendency is therefore in many cases to allow the stock to run down which results in inadequate provision to take care of the current models. This naturally leads to poor service on cars more than one or two years old. Another disadvantage to the service station manager is the one which he always has in training his mechanics. Some of his crew are familiar only with the present models and it is pitiful to see them try to repair one of the older models.

It is highly essential that the manufacturer keep his product up-to-date, for in no other industry do we find such rapid development as in the automotive industry. Therefore, I do believe that serious attempts should be made to perpetuate a fundamentally good design over a period of several years. It is inconceivably bad, in my estimation, to bring out a new motor in which the cylinder bore has been increased only a small fraction of an inch in order to gain a little power, and at the same time pile an unusually great weight upon the chassis and body by substituting a large amount of sheet steel for sheet aluminum in building what is generally considered a high grade car.

Precisely the same thing applies to many other parts. Why make very slight dimensional changes in shackle bolts so that they are not interchangeable with the last model; likewise with respect to connecting rods, various bearings, and innumerable small parts all over the structure? The hardware and locks on the bodies result in nervous annoyances to the owner who does not live adjacent to one of these "Super Service Stations"—advertised so proudly.

In making my plea for an enduring design, I think that I have made it perfectly plain to you that I am in favor of constant betterment. You would, indeed, be much surprised to see how you could improve the various component parts of the motor car and still have them interchangeable with the old parts, were you to make up your mind to do so.

If you develop a more efficient intake manifolding system, why not have it fit your old cars which are running around the country by hundreds of thousands? Why not attempt to give better service to these owners of old cars? If you change the radiator design, why not make it possible to put the new radiator on the old car with possibly a service hood to fit? This has been done very successfully on one high-priced car, and incidentally I have found that owners have greatly appreciated this feature.

There is a very important psychological effect in a case of this sort because although an owner might not actually decide to make such a change, he would feel that if at some future time he should want to dispose of his car, he could exercise this option. Unquestionably he appreciates the fact that the manufacturer is bearing him in consideration, and is not, as is usually the case with the yearly model manufacturer, deliberately depreciating the owner's investment.

The wonderful progress in metallurgy has made it possible to decrease the weight and at the same time increase the strength of many motor and chassis parts. And, I have found it possible to make such improved parts interchange with the older "vintage." I find that in pursuing such policies a great plant can be operated without shut-downs year after year.

The sales department can assure the prospect that there is no need waiting a few months before buying —just think what a wonderful argumentative leverage the salesman possesses when he can look his prospect straight in the eye and say, "When an improvement is made at some future time, you will be able, at nominal cost, to apply it to your car."

In this discussion I have made very little reference to the design and engineering of the body. A body may be beautified and redesigned continually. Parts that have been shown to be fundamentally weak can be strengthened with better material and improved designs, but it is highly desirable that even a new body should interchange with an old one, for many times after serious accidents in which the old body is wrecked, it is more satisfactory to the owner to buy a new one. In such a case, it is certainly more desirable to furnish him your very latest design. Furthermore, many people might care to buy new bodies of a different type and they would, of course, appreciate it if it could be readily fitted to the old chassis. A policy of this sort makes it a simple matter to maintain service stations without the necessity of carrying the aggregation of stock which is absolutely necessary to service several models. Also in reconditioning the cars and motors, it will enable them to sell many new parts for the sake of bringing them up-to-date. This makes it possible for the service station greatly to increase its profit; I know this to be true by actual investigation.

I wish it thoroughly understood that I have the best interest of all concerned in mind. By that I mean the factory fabricating the product, the sales organization, the stock-holders, and finally the great buying public.

658.9:629.1

Should Automobile Manufacturers Make or Purchase Their Accessories?[1]

I. By J. H. MARKS
Purchasing Manager, Packard Motor Car Company, Detroit
II. By F. C. SHAFER
Secretary, Pemberthy Injector Co., Detroit

I. By J. H. MARKS

THE meaning placed upon the term *accessory* must be clear in our minds before an intelligent discussion of this subject can take place. The common definition of this word, without consideration of its semi-technical meaning in the motor industry, is an attachment in the nature of an appendage that is an aid in the attainment of some desired result. In the motor industry the meaning is not clear, in that some believe an accessory is an attachment to an automobile not essential to its operation but an aid to its efficient, convenient and comfortable use, while others believe that it is any part of an automobile with the exception of possibly the motor and transmission.

No attempt will be made strictly to define the meaning of the term, accessory, for the purpose of this discussion. Apparently the question concerning both the manufacturer of finished motor cars and the maker of parts or attachments or accessories, whichever they may be called, is the extent to which the manufacturer of the finished product should go in making everything that enters into the finished product.

The answer to this question probably must be based on the proposition that, in the last analysis, the plan which results in obtaining the desired quality of finished product at the lowest ultimate cost is the one that competition will require to be followed, for whatever business practices or methods result in the greatest economy are the ones that are developed and used in any competitive industry. The question under discussion then becomes, Is it more economical for a manufacturer to make or buy the accessories entering into the finished product?

In discussing subjects of economy we must have in mind not only the prime cost of labor and material but the indirect cost involving organization, development and engineering, all of which depend to a large extent upon volume of operations.

Accessories can easily be divided into two classes: first, those parts of an automobile which though formerly accessories have through development and use become essential parts of all cars; and second, those appurtenances to a motor car that are not primarily essential to its operation.

Under the first division come headlamps, starting and lighting equipment, speedometers, storage batteries and even windshields and tops, all of which at one time in the history of automobile development were considered as non-essential. Not many years ago cars were sold without tops, windshields and headlamps. It was not long, however, before tops and windshields became a permanent part of all motor cars. After oil lamps came gas headlamps with an acetylene generator and then the pressure storage tank. Ignition current was furnished with magneto and dry batteries. With the advent of electric headlamps came the lighting generator, the storage battery and the starting motor, all of which have since become essentials of every automobile. Speedometers are now considered necessaries and are no longer sold as special equipment.

All of these parts, once accessories but now considered essentials, are still almost universally made by separate businesses.

In the second classification, still considered as attachments, are bumpers, tire covers, spot lights, gasoline gauges, motometers, rear view mirrors and others, though some of these are now fast coming to be considered essentials.

If we consider some of the other parts of a motor car not looked upon as accessories, perhaps some light may be thrown upon the subject under discussion.

There are very few manufacturers in the business of producing an automobile who make coil and leaf springs, ball and roller bearings, wheels, tires and other similar parts—but these will be sufficient to illustrate the point in mind.

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[1] Papers presented at a meeting of the Taylor Society, Ann Arbor, Michigan, May 15, 1925.

Before the development of the motor car industry all of these parts were used for other purposes. Coil and leaf springs have been used as parts of other mechanical devices for many years, though perhaps in much smaller quantities, and these parts are, of course, still so used. Logically, therefore, being produced in a separate plant as a separate business, they can be produced more economically than a single manufacturer of motor cars can produce them in his own factory, unless the quantities required are greater than those produced in any single plant. The same conclusion can be reached with respect to ball and roller bearings, because their use is even more general perhaps than leaf springs.

Wheels and tires were made for wagons, carriages and bicycles before they were used on automobiles, though the business of making them has become so specialized that no longer are wheels, at least for other than motor cars, made in a plant devoted to anything else.

The manufacture of tires involves not only tires of many different sizes but other rubber goods as well, and the sale of tires for original equipment is only approximately 30 per cent of the total sales of tires produced.

It is apparent, therefore, that certain parts that are essential to the construction and operation of an automobile have been produced, generally more economically, outside the plant of the car manufacturer.

Going back now to those parts which are more generally and more recently classed as accessories, such as headlamps, starting and lighting equipment, speedometers, storage batteries and so on, we can perhaps apply the same reasoning to them.

All of these appurtenances with minor modifications of size and design can be used in all cars. All headlamps have lenses, reflectors, lamp sockets, connecting plugs and so forth, which with a few modifications in size and variations in design of shells and doors are adaptable to any design of car. The same facts apply to starting and lighting equipment and storage batteries. In addition, storage batteries have many other uses in telephone, radio and other electrical apparatus.

Speedometer heads with different combinations with other instruments and with individual designs of faces and bezels and with connecting cables differing only in length, are made to suit the designs of individual manufacturers. The principal parts of the head mechanism and shafts are in general the same to fit any given requirement, so that with only a few different principles of design, they are all the same. It is logical, therefore, that they too can be produced more economically in a plant supplying these to several manufacturers than to one, unless, of course, the volume required by any manufacturer is greater than the volume required by several.

The subjects of development and design are also deserving of consideration in the study of economies. One has only to consider the millions of dollars that have been expended in development and design of all the parts of an automobile to appreciate the importance of this consideration.

Take for instance the matter of starting, lighting and ignition equipment. This development has gone on from the inception of the gasoline engine. Tremendous changes have been made almost from month to month during the years of the development to its present stage of seeming perfection, but still improvements are being made as the result of research in this field. What an appalling cost all this has entailed, and how impossible it would have been for each manufacturer of motor cars to have carried it on independently, as he would have had to do if each had engaged individually in the manufacture of such equipment!

As another illustration let us take the case of the development of the headlamp. The glare of headlamps with simple reflector and plain lens caused the development of the lamp capable of being dimmed. In recent years the requirements of safety in the increasing traffic of automobiles has occasioned the development of lenses to converge and deflect the beam to the road. The design of headlamps is still in an unsettled stage, as the requirements of state laws to insure safety are becoming more stringent. The cost of this development has been borne by the lamp manufacturers, who have been able to serve the manufacturers of automobiles more economically by spreading this cost over them all than each could have possibly served himself.

In the case of the second division of accessories, those which have not yet become of universal use in all cars, including bumpers, gasoline gauges, tire covers, motometers, spot lights, rear view mirrors and others, those who do not supply them as original equipment are not concerned with the question of whether to buy them or make them. This class of article has a larger sale at present to the automobile owner than to the manufacturer, and they must be made by others than the car manufacturer. The discussion regarding the first classification of accessories, those which have become essentials, covers the second classification as well, because there are many illustrations that the accessory installed for convenience today becomes a necessity tomorrow.

The success of a manufacturer of an automobile is determined by his ability to serve the public with what it wants, and he must be responsible for the service which his product gives. If he makes an automobile that offers as much value to the purchaser as others sold at the same price, with proper sales effort and manufacturing methods, he will sell his proportion of cars and make a profit. Granting the ability to sell, it is only necessary to manufacture economically, and this involves the question of what to buy and what to make. The car manufacturer is responsible for what he buys as well as what he makes, because he is directly or indirectly responsible for everything that goes into his product. He must decide then, first, what he must have in his car that will serve best and for which he is willing to assume responsibility; and second, whether someone else, an accessory manufacturer for instance, can make this article more economically than he himself.

As previously pointed out, the problem of economy involves the cost of design and development and the relative volume of production—two interdependent and indeterminate factors, indeterminate, however, only with respect to general conclusions. One design of product will permit a certain price and bring a corresponding volume and another design will result differently. Simplicity of design will permit of lower price and bring larger volume, giving a wider distribution of development cost.

Each case then must be decided by itself, because what may be more economical for one manufacturer to buy may be more economical for another to make.

The answer to the question of our subject therefore depends upon two things: first, the design demanded in his product to best serve the purchaser, that is, whether he can afford to design an accessory peculiar to his car; and second, upon the volume of manufacture. It is evident that each manufacturer of automobiles has a different problem.

The answer to the question is further complicated by the fact that progress will change the answer for each manufacturer, since change in his design or volume may create a different set of conditions, and consequently the facts which determine the economical method may not be the same at some future time.

II. By F. C. SHAFER

THERE is a story told of a man who started a popcorn stand at the Pennsylvania Station in New York, studied his problem from A to Z, and became a specialist on popcorn in all its details. He established a reputation for making the best popcorn in New York and became rich. When he decided to expand and took on the preparation and sale of peanuts, he failed in six months. It is impossible to become a specialist in all things.

It occurs to me that there are really two kinds of accessories: first, those that do not vitally affect the mechanical running of the car; and second, those that are responsible for the correct functioning of the automobile. Those accessories entering into the building of the car that do vitally affect the mechanical running can be better purchased from accessory manufacturers whose reputation, engineering ability and success lie in making good in this one accessory. In the case of the other accessories it becomes largely a question of quality and comparison of cost.

Through specialists the automobile industry is able to market its product at practically 25 per cent under the pre-war selling price as compared with the average price of other commodities now 70 per cent above pre-war prices. Not only this, but the motor car of today, although it is submitted to the most severe service of any known piece of machinery, stands up under many cases of careless handling, inattention to lubrication, and so on. When we take into consideration that there are upwards of 1700 different parts entering in the modern car, this is an example of what can be accomplished by concentration on every detail entering into a product.

The automobile of today is a composite result of the work of specialists who have concentrated brain, material, resources and experience on the several parts entering into the whole.

Real engineering ability is hard to find. We have all known cases where a poor body design is responsible for the failure of a car to be popular, although mechanically the car is sound. The same is true of accessories. We think that it is impossible, with the diversified interests that are common to the manufacturer of the automobile, for one engineering and production organization to give the functioning accessories the concentration and attention necessary. They demand the aggregate efforts of engineers and producers who are specialists.

As a brass manufacturer I have had occasion to come in contact with the brass divisions of several large automobile companies. With becoming modesty, but to prove the point, I must acknowledge I was thoroughly disappointed at the inefficiency and apparent lack of knowledge and experience of their brass departments. The impression was immediately created in my mind that because it is a minor division it does not receive the attention given to other and larger departments.

The tire of today is an outstanding example of what can be produced by specialists. Why not employ the services of manufacturers who are leaders in their line of accessories? Why not take advantage of the publicity which standard manufacturers create in the minds of the public through the advertising of their accessories? Why not take advantage of the servicing which is also offered to the public in the case of many standard accessories?

I hold no brief against the motor car manufacturer who advertises that his car is built complete under one roof, although the public knows that this is not true. The public has been educated to the use of standard accessories. Does it not prove our point that so many motor car manufacturers, by their everyday practice of purchasing the important accessories, admit that they can be built better by specialists who are concentrating on the one thing? Is not the point proved also by the fact that the automobile manufacturers of today are outstanding in the efficiency of their methods in all branches of their business? Surely if it were better that the manufacturers make their own accessories, the keen competition and necessity of efficient methods of today would force them to a common practice.

I wish to quote in conclusion from a letter which I received from one of my friends, who is a large manufacturer of important accessories:

> Our conviction is that a specialized manufacturer of accessory parts, due to combined volume, is in better position to develop low overhead than a large plant not specializing on that particular type of product. Such an arrangement enables the accessory manufacturer to employ more skilled supervision because such expense is distributed over the greater volume.
>
> Manufacturers of engineering specialties are generally better equipped to control a patent situation for their particular product than larger companies and to concentrate on the advancement in the art and development in manufacturing methods better than manufacturers to whom this work is a secondary consideration to some other class of product.
>
> Your own experience parallels ours all along the line, as we have learned by very real experience that foundry practice for our specialized type of product requires entirely different practice and supervision as compared for example to the ordinary brass foundry to be found in an automobile plant. This same condition holds true through all of the machinery and assembling and is again emphasized at test.

The Taylor Society Abroad

Organization of Japanese Branch

ONE of the most significant developments of this year is the increasing interest in scientific management in countries other than the United States. This has been reflected in increasing interest in the Society abroad and most recently by steps taken by the membership in other countries and by the Board of Directors, leading to the organization of branches abroad.

The Japanese Branch of the Taylor Society is the first to effect complete organization. By letter ballot June 15 the Japanese members elected officers: Yoichi Uyeno, Managing Director, and Shinzo Uno and Goro Togano, Directors; and established the office of the branch in the Institute of Industrial Efficiency, Tokyo. There are at present fourteen members in Japan.

It is expected that this branch will do important and constructive work for Japanese industry and will eventually come to have great influence for better management.

Meanwhile members in England have been conferring with reference to the formation of a British Branch, and there is every indication that the organization of this important branch will be consummated by the end of the year.

Why Systems Fail[1]

Ready-Made Systems and Systems Which Just Grow Up Are Seldom Efficient—An Efficient System Must Have Purpose and Unity

By **ROBERT JULIUS ANDERSEN**
Bowen Products Corporation, Auburn, N. Y.

EXPERIENCE has proved that if a thing is to be done efficiently it must be done systematically. Yet if there are two words which have been a curse to industry, they are *efficiency* and *system.* Some of those "engineers" who have exploited American industry have employed these words as though they mean the same thing. They have conceived efficiency as the certain result of a system, and have conceived system as red tape. Efficiency means the securing of results in the best possible way—in the least time and with the least expenditure of effort. A system may contribute to this end or it may not—too frequently it does not.

Our plants are loaded with production, accounting, cost, statistical and other systems, and many of them, at least large parts of most of them, are useless. A general manager would receive a rude shock were he to ask the operatives concerned a number of leading questions such as the following:

1. Do you believe this is a good system? A necessary one?
2. Do you think you could devise a better one?
3. What use is made of the output of your unit of the system?
4. Do all the people concerned with the system understand what they are doing and why they are doing it?

The principal reason for the failure of a system is that it does not reflect a definite purpose and a comprehensive plan. Most systems just grow up. A man starts in any kind of business. For a time he is general, captain, sergeant, private—the whole force. The business grows and he finds it necessary to secure assistants and to put on record things that should be generally done and things that should be generally understood. Not one time in a thousand does he do this with any general plan in mind—he simply jots down things as they occur to him. Before long an analysis would show that many essential things have been omitted, and many things included are unnecessary and unprofitable.

Another reason why these planless and unprofitable systems develop is because department and other unit heads are left to devise their own unit systems. These units eventually become united into a whole which operates with much working to cross purposes, duplication and waste. Generally speaking, no department head has his eye on the same goal precisely as the general manager or as other department managers. The general manager is interested in net results—in net profits. The department manager may be interested in department net profits—or he may not; he may, for instance, be interested in system for its own sake, which usually means a complicated and costly system.

Another kind of system that is likely to prove inefficient and costly is the ready-made, installed system, even though it may originally have expressed a general plan and have possessed unity—in another place. There is no idea possessing managers which retards progress more than the idea, "my business is different"; yet there are local conditions in every plant which cannot be disregarded with respect to their bearing on details of a system. The plastered-on system seldom fits, or if it at first seems to fit, it is because local conditions have been temporarily modified to fit the system. Gradually these local conditions return to their normal and it is discovered that the system doesn't work. A young tree may be shaped by tying to a stake, and sometimes such shaping is permanent; but generally after the stake is removed the tree will shape itself according to its basic characteristics modified by local conditions of soil, winds, shade and light. A tree is a living, growing thing, with dominant characteristics influenced by environment. So also is a live business.

There are four good tests of a system.

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[1] Abstract of an address at a meeting of the New York Southern Tier Section of the Taylor Society, at Elmira, N. Y., April 13, 1925.

1. Does it represent a definite purpose—work towards a definite net result? Therefore does it have unity?

2. Does each element of the system play a definite part in accomplishing the net whole?

3. Is there duplication of the parts played by the various elements of the system?

4. Is there lacking any element necessary to the accomplishment of the net whole?

A simple searching test with which to begin the appraisal of a system is expressed in the questions, with respect to each element of the system, Is the action which the system requires essential and worth its cost? Is the information being compiled used and is its use worth its cost?

Executives hesitate a long while before they will actually scrap any system. A manager will not hesitate a minute to replace expensive machinery once his engineers prove to him that it is necessary; nor will he hesitate to scrap a piece of obsolete equipment, or sell an inactive machine for any price he can obtain for it; but scrap a perfectly good system—never! He often looks upon it as a mysterious sort of possession. Why, it has been in use for years! Think of the money which has been spent to maintain it; why throw all this away? Perhaps he feels that he is competent to rule on the big questions of finance and of general policy; but system, a matter of infinite detail, the very word sends chills up and down his spine!

Systems of all kinds group themselves under several distinct heads:

1. Ready-made systems installed by an outside consultant. These systems are based upon some common plan and are sometimes adapted to the needs of the organization. Usually they are either production control systems, cost control systems, accounting systems, or a system to cover all these branches. These systems must be approached with care. There are very few places where an outsider can install successfully a ready-made system. Generally the system works while it is being governed by its progenitor but as soon as it is turned over to its adopted parent, trouble begins. There are exceptions, but for every success there are countless failures. Another bad feature of this method, and one of the chief reasons for so many failures, is the fact that the management often thinks its job is done when the decision is made to have the system installed. The managers wash their hands of the whole affair and instead of giving the outside consultant the full benefit of their years of experience, they leave him to find it out the best way he can. The installation of a comprehensive system should not be a matter merely of high pressure salesmanship. Unless the management and the administrators feel that the very success of the business depends upon it, nothing should be attempted. Better to guide the ship by avoiding the known rocks than to hang up a chart and think you can read it without the aid of a compass.

Business has grown so large in some cases that the management is too far away from the scene of activity to be able to render just decisions on these matters. You cannot umpire a ball game from the grand stand; neither can you sit in an office in one city and decide the destinies of an industry miles away in another city. It has been done, is being done, and as long as it continues to be done, systems will fail. This idea of having men in charge of big jobs so restricted that they cannot act upon an original idea if it costs money without having it approved by some distant manager may sound all right, but it simply makes managers high priced clerks. A manager should manage and not simply carry out instructions. If he cannot manage, replace him; but he should manage.

2. Systems built by the organization itself as part of a complete plan properly to develop, control and execute all of the various details connected with the task of management. Systems in this category depend entirely upon the ability of those responsible for their development. If those concerned are well trained and have a good background of experience, with a knowledge of what is being done elsewhere, success will often crown their efforts. The main trouble here is that too often the organization is handicapped by a lack of regard of executives for one another. Each executive thinks the other one is "getting away with something." They are apt to underrate one another's ability, especially when it comes to decisions affecting their several departments.

At times it seems as if we suffer from the woes of specialization. Executives are highly trained in their particular phases of the business, but they are unable to think in general terms because of a decided lack of knowledge of the general principles of conduct governing all business. This lack of knowledge tends to make each think that his function is more important than any other function and this causes friction between departments. No system which is woven into many departments can survive a mass attack from the heads of all departments. Unless all believe that the system is necessary, and that it is, in part, of their creation, it will not stand up under the stress and strain of the daily onslaught. If any system is continually being picked apart by antagonistic executives it cannot fulfill its mission. All concerned should plan and create together, and someone should pass on the thing as a whole before it is started. Once started, all must work together. Each must concede something to the other. Each must be willing to pocket departmental pride for group pride. Unless the management in its entirety is a compact working unit, no system will succeed.

3. Systems built by the organization itself with advice from an outside consultant. Most systems are so developed. If a management is wise in its choice of a consultant this is an ideal arrangement. It is better if the initiative comes from the inside, better to call upon the consultant than to have him call upon you. Every profession but business seems perfectly willing to call upon outside counsel when needed. Medicine, surgery, law, art, music—all except the profession of managing—seem to sense the need for expert advice in the matter of special and difficult problems. Perhaps this lack is due to the fact that business has yet to formulate a set of laws applicable to all business. At any rate, when an organization feels the need for a closer control over some or all of its functions, that is the time to call for help. A surgeon friend of mine once asked one of the leading surgeons of America when should a patient be operated on for appendicitis. This learned man of medicine made an illuminating, terse reply: "The time to operate is when your diagnosis shows that the patient has appendicitis."

The time to call for outside counsel is when the management is satisfied that the answer to their particular problem lies partly or wholly in the hands of one who will bring a fresh viewpoint and a varied experience, one whose training and very experience enable him to do what he is required to do—act as a counsellor.

If a management contemplates a large expenditure of money for a piece of production equipment, it searches the country over for the best. I have in mind a corporation whose production manager brought to light the need for a piece of production machinery which cost approximately $75,000. This company left no stone unturned to obtain the best. They not only had bids from many companies but engineers spent several months at a cost of several thousand dollars visiting plants all over the United States. When they were ready to act, the engineering department drew up a brief setting forth every fact and figure connected with the proposition. After this, and before the order was placed, they submitted this brief to a competent consulting engineer. He visited the plant, studied the job, made certain suggestions and they placed the order. The consultant's suggestions added about $10,000 more to the cost of the machinery, but he was the means of making a considerable reduction in their production costs.

Yet many a management will install a system without any more consideration than if they were buying a bunch of letterheads—and then wonder why it fails.

4. Systems developed by department heads to handle various tasks connected with their respective departments. Such systems are rarely part of a general plan. They are devised for carrying out the various functions of individual departments. Yet even the smallest of them directly or indirectly affect some other function, some other department.

How often a department head starts some system in his department on the impulse of the moment. He finds that he is without certain information or certain facts, so he starts a system. "Get out some forms," says he. Forms are the roadbed of the railroad represented by system. On this roadbed must be laid the rails of orderly and organized procedure and over these rails passes the train of information or facts. Too often some clerk or tracer in the drafting room "gets out the forms." If every department head would spend an average of one day each month studying the systems of his department, noting how they work, whether they meet the need they were built to meet, whether the information is supplied in the proper manner, in the proper place, and at the proper time, he would learn a great deal. As long as department heads operate their branches of the business as if there were no other branches, just so long shall we have these ill-begotten systems.

5. Self-contained system units sold by organizations to buyers for limited, specific purposes, such as bookkeeping systems, visible indexes, filing systems, and so on.

This last group of systems seem at times to give us the most trouble. They are systems sold as such, to be installed intact, and very often by a salesman. With the manufacturers of these things we should have no quarrel. They are meeting a certain need and they are providing a satisfactory service where that particular kind of service is needed. But we are going too far. Some places of business look like the convention grounds of a group of equipment makers. Who is to blame for this? The seller of the system? No, the buyer. Why should any business have any particular system just because some other business has it? Why should every stores record be a visible record just because some of them are visible? Why should all time cards or job cards be of a certain kind? Why should every sales department have the same kind of maps? And so on ad infinitum. No reason whatever..

We are suffering from too much standardization in certain quarters. Companies seem to pride themselves that they have but one kind of typewriter, one kind of calculator, one kind of job ticket, one kind of stores record, one kind of control board. Just as if business had reached the point where all one needed to do would be to pick out what appeared to be the best set of systems for a business and go to it.

Too often these systems are bought without any consideration whatever being given to their maintenance cost. Too often a smooth salesman makes an executive believe that anybody can maintain them. He brings in a ponderous looking set of records or a mysterious looking machine and he proceeds to prove to us that his system is very simple.

Rarely are these systems made part of any general plan. The business that houses a statistical department where all data pertaining to every branch of the business are compiled, analyzed, and developed into real reports is generally free from this curse of all systems, but a business without such centralized departments exhibits a conglomeration of well-advertised brands of systems. Some day we shall buy the tools of management the same way as we buy production tools, and when we do, purveyors of systems are going to have a hard time. Then we shall not have selling us accounting systems salesmen who cannot do simple double entry bookkeeping; neither shall we have to listen to an army of salesmen who lack fundamental training in the particular fields in which they are trying to sell some of the tools necessary to obtain managerial results.

No system is a substitute for executive ability. No system can replace the brain power needed to man a business. No system can be a panacea for the ills of an incompetent management. Systems are nothing more than a means of giving expression to the ideas of those who manage. When any business attempts to solve its problems with systems instead of with knowledge and experience, its doom is sealed. Executive ability without system means chaos and inefficiency, but system without executive ability means disaster.

The Apprenticeship System in a Large Paris Department Store

By Julia Lesser[1] 658. 871

IN THESE days of elaborate departments of training and carefully worked out plans for the training of new employees in our large department stores, it is interesting to note that the old apprenticeship system still prevails, though slightly modified, in the large continental department stores.

At the largest department store in Paris, employing a personnel of well over 5000, and doing a business easily comparable to that of our largest New York stores, the following is the system of training new employees.

The young woman, who must be at least 16 years old, makes her application to the employment department giving information about her education and previous experience if any, the number of languages she speaks, whether she lives at home with her parents, her parents' business, etc. She must wait a minimum of two weeks, usually more, after entering this application before receiving any answer as to whether or not she will be engaged. During this time, an investigation is made of the truth of the statements on her application and an inspector is sent to observe her home and family conditions.

When she enters the store's employ, she is given a medical examination to make sure that she is strong enough for her work, and then a brief interview with the director who acts as personnel manager, in order that he may make her acquaintance. She is then placed as apprentice (the word used is "debitrice," which means literally "debtor") in a selling department. The head of the department to which she is assigned and his assistants are entirely responsible for her instruction in the ways of the store. She is assigned minor jobs in the department at first, such as running errands, doing up packages for special orders, and making herself generally useful, and later occasionally assists the sales clerks in making sales. In some of the stores using the old cashier system, she is sent by sales clerks with customers to make payments and wrap merchandise. Thus the information she picks up about the department's methods is acquired very gradually and in the course of her work and her acquaintance with her fellow workers.

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[1] Planning Department, R. H. Macy & Co., New York, now abroad studying European department stores.

During the twelve to eighteen months which she must spend as an apprentice, she is transferred about to two or three selling departments and usually spends a short time becoming familiar with the general location of the reserves and something of their system. At the end of her apprenticeship she is assigned to one of the departments in which she has been "debitrice."

In the first month or two of her apprenticeship, the "debitrice" is more or less on trial, and if she passes this period of surveillance she is practically assured of a situation for many years to come, for the labor turnover of this store is very small. The apprentice is paid weekly at a day rate for a six day week. Her wages vary according to her age, from 7.85 francs per day for girls of 16 to 16.10 francs for those over 23.

For the most part it is taken for granted that the young "debitrice" lives at home with her family, for it is almost impossible for her to support herself on these earnings under any other circumstances. As a "debitrice" she is not provided with her lunch by the store, as the regular employees are, but is given an hour and a quarter to get her lunch outside of the store or to go home for it. She finds it necessary to spend a minimum of about three francs for her lunch, and can only succeed in getting it thus cheaply at some neighboring convent which provides meals especially for young working girls. It is interesting to note that the "debitrices" are practically never observed to bring lunches from home.

The hours of work are from 9:00 A.M. to 6:30 P.M. from Tuesday to Saturday, and from 1:00 P.M. to 6:30 P.M. on Monday. Usually the "debitrice" is required to come about fifteen minutes before the store's opening to help uncover counters and set out merchandise.

When the "debitrice" becomes a regular sales clerk, she is provided with her lunches by the store and earns an average of about 500 francs a month. It should be noted also that experienced sales clerks are occasionally taken on directly by a selling department and are not required to come in as apprentices.

Reviews

Psychology in Business Relations. By A. J. Snow, Ph.D.[1]. A. W. Shaw Company, Chicago, 1925, pages xv, 562. (15:658)

Under one cover Dr. Snow has presented a veritable carnival of business psychology. It is a text on advertising, on salesmanship, on selecting workers, and on marketing all rolled into one. There are separate books written on the psychology of each of these subjects which contain less material than Dr. Snow has succeeded in crowding between these covers.

Those much overworked "springs of human action"—instincts—the author finds not only unnecessary for his presentation but he seems to be very suspicious of their existence. In this he has with him the modern thought in psychology and the bulk of recent evidence. But it will strike the reader unusual not to find half of the material on advertising dealing with "instinctive appeals." This reflects, however, upon his previous reading rather than upon Dr. Snow's book.

Should the economist read through this book, one rather fears that from time to time he would say, "They call this psychology? If it is, I'm a psychologist and not an economist." And I, for one, as psychologist, would not feel justified to argue with him on more than a fourth of the pages. The book would have been more accurately named "Psychology and Common Sense in Business Relations," but this, of course, does not militate against the worth of the book. Rather does it reflect the present somewhat unfortunate status of psychology—our definite psychological *knowledge* of business relations is limited and scattering. Dr. Snow by research is making this less limited and less scattered, but in presenting a fairly systematic outline in book form it has been necessary for him to use wisdom where information failed or was missing. The present book has undeniably profited by the large admixture of psychology which Dr. Snow's experience has made it possible for him to put into the subjects treated.

The reviewer's opinion is that most need exists for a book on "Psychology in Business Relations" which will show the reader how psychological insight into business matters is gained by psychological experimentation. The field will benefit most by the increase of those who know about the research methods and the reader will benefit most by learning these methods which have been found of immense value in many industrial and business applications. In the present status of business psychology or industrial psychology the methods rather than the sum total of findings are of most use to the individual industrialist.

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